

# Invasion of the Flying Disks



Like any publication with a scholarly bent, the *Lunar and Planetary Information Bulletin* regularly receives copies of books from publishers hoping for a review or release notice. In recent years, however, many of these books have begun to be replaced by shiny metallic disks, packed with data, text, pictures, and movies. Often, these CD-ROMs are elegantly produced; just as often, they are haphazardly organized, giving ammunition to those who criticize electronic publishing as an easy way to reuse old images and data.

The advantages of CD-ROM publication are readily apparent. A compact disk allows a text to be supplemented with high-quality digital images, movies, sounds, and Internet hot links. Disks are highly portable and take less shelf space, although the disks in and of themselves are useless without a capable computer. Compact disks have long been the standard in music and computers for “prerecorded” music and software, and experts are already predicting the demise of the popular home video tape as the new DVD technology takes hold.

With any relatively new medium, there is always the danger of premature obsolescence, and many have expressed fear that CDs are nothing more than a transitory medium like the much-maligned 8-track tape. Indeed, DVDs, while similar in appearance to CDs, far surpass the medium in terms of data storage capacity and the ability to reproduce quality video.

While CDs are slowly making inroads into more traditional publishing — including the publication of single-volume CDs encompassing entire libraries of literary classics — the scientific world has embraced the medium with more enthusiasm.

Electronic publication seems particularly well suited to scientific publishing in that it allows for more images and data files as well as search mechanisms that negate the need for cumbersome indexing.

The Lunar and Planetary Science Conference has been touched by the swing toward electronic publishing. The conference has gradually phased out its “Yellow Peril” three-volume abstract sets published each year in conjunction with the conference in favor of a single CD-ROM. Although abstracts from the conference must be viewed using Adobe® Acrobat® software (included on the CD-ROM), the switch has allowed for faster processing of the abstracts and a drastic reduction in printing costs. In addition, the new format allows authors to include color figures with their abstracts and to create their own small hard-copy volumes composed only of those abstracts of interest to their discipline.

While authors and bibliophiles may deride the rise of the CD-ROM as an unsuitable substitute for the traditional book — which can be taken on a bus and read without the aid of a laptop computer — it is obvious that the digital medium (whether in the form of CDs or some higher-capacity storage device) is here to stay. With that in mind, we have here gathered reviews and descriptive summaries of several NASA-related data and educational CD-ROMs. As a whole, the reviews (all written by LPI staff scientists) give a good overview of where this trend is going, and where it may yet go.

## ***Imagine the Universe!***

**Produced by the High Energy Astrophysics Science Archive Research Center (HEASARC) at the NASA Goddard Space Flight Center.**

*Imagine the Universe!* is an educational compact disk that describes the large-scale structure of the universe and how it is studied via high-energy astronomy and astrophysics. The CD was written by astronomers and programmers at HEASARC, and it targets a general audience as well as teachers and students at intermediate and high-school levels. This CD is in fact a copy of HEASARC’s *Imagine!* Web site as it existed in January 1998 and it can be viewed on a Mac or PC using any browser. The content is delivered via descriptive text that is amply illustrated with figures, movies, and audio clips. Although a young user might find the use of scientific jargon rather challenging, definitions of all scientific terms are just a click away. The CD contains discussions of most of the topics that one might expect of an encyclopedia on high-energy



astrophysics: galaxies, black holes, neutron stars, etc., as well as descriptions of X-ray, gamma-ray, and cosmic-ray astronomy.

Although generally informative, the coverage of individual topics is somewhat uneven. For instance, the CD provides a very compelling and up-to-date description of the latest findings on gamma-ray bursts, yet its treatment of all of cosmology (i.e., the Big Bang, origins of the elements, and expansion of the universe) is rather terse and uninteresting. While this CD does not provide a “grand view” of the universe, it does a good job of informing the user about the universe’s varied members (e.g., galaxies, stars, and their endstates) and how they are observed using X-ray and gamma-ray satellites.

Also included on the CD are snapshots of several other astrophysics and spacecraft-related educational Web sites, though these are of smaller scope than the *Imagine!* site. There are also several astronomy-related lesson plans that teachers of grades 6–12 might find useful. Also included is a modest amount of content aimed at children 4+ years old; although this reviewer found the astronomical sing-a-longs rather amusing, they did drive the spouse from the room. As far as “edutainment” goes, the *Imagine the Universe!* CD probably has a low likelihood of repeat usage since it is not as visually stimulating as other educational software and astronomy Web sites. This, perhaps, is the curse of gamma and X-ray astronomy, which can sometimes seem to be little more than the study of fuzzy blobs of light. Nonetheless, HEASARC has produced a quality CD on high-energy astronomy and astrophysics that students and teachers will no doubt find to be a useful and informative reference.

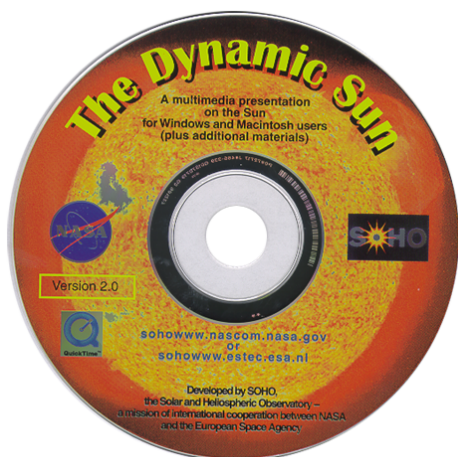
— Joe Hahn

### **The Dynamic Sun**

**Produced by SOHO, the Solar and Heliospheric Observatory.**

**Suitable for middle-and high-school students.**

**Available through NASA CORE.**



This CD consists of PDF files that contain multimedia presentations about the Sun. There are two primary presentations on the CD: one geared toward middle-school students and one geared toward high-school students. Each presentation consists of about 50 viewgraph-style pages that describe various aspects of the Sun and its relationship with Earth. In addition to a number of spectacular individual images, many of the pages can be clicked on to play videos of a number of time-lapse images. An Acrobat file that is a teacher’s guide for each presentation is also on the CD, and it gives supplementary information and tells the teacher what the key points are that the students should take away from the presentation.

The primary topics covered in the presentation are the structure of the Sun, the Sun’s appearance over time and at different wavelengths, solar flares and their effect on Earth, and interaction of the solar wind with Earth and comets.

Going through the entire presentation would take a couple of class periods and would probably best be accomplished using a computer-screen projection device. The middle-school presentation is mainly a sequence of bulleted slides while the high-school presentation is more of a narrative style, and I personally preferred the latter. Most of the images are unique and of high quality, and with the inclusion of the video clips the overall presentation should generally be interesting enough to hold the students’ attention. While it seems unlikely that there are very many science classes that wish to discuss the Sun in as much detail as this CD does, there are some great images and video clips of eclipses, solar flares, a comet going into the Sun, and other topics that could be excerpted and used in a wide variety of science classes. The teacher’s guide and directions on how to use the CD are well written and easily comprehensible. The CD also contains some classroom exercises (not particularly good), and Acrobat versions of a SOHO poster and two SOHO lithograph sets. The CD will work on both PCs and Macs. I would recommend this CD to anyone teaching a class that covers the Sun in some detail, and some of the images and video clips would be great for general class units on the solar system.

— Robert Herrick



### ***Mars VE, The Virtual Exploration Mission***

**Produced at NASA Ames Research Center.**

**Targeted for grades 5–8.**

**Available through NASA CORE or at**

**<http://exploringspace.arc.nasa.gov/vecd.htm>.**

**T**his CD contains as a printable Acrobat file a series of exercises culminating in planning and reporting on a mission to the planet Mars. There are both student's and teacher's versions of the activities guide. A third of the exercises utilize a stand-alone interactive program on the CD. The program has a sophisticated graphical interface where the user navigates through four domes in a futuristic-appearing space base. The four domes provide information on four topics: basic facts about Mars, different techniques for exploring the planets, an overview of the different fields of study in planetary exploration, and a survey of potential landing sites. The program runs on both PCs and Macs, and sound capability is necessary.

### ***Craters! A Multi-Science Approach to Cratering and Impacts***

**By William K. Hartmann with Joe Cain**

**Published by the National Science Teachers Association.**

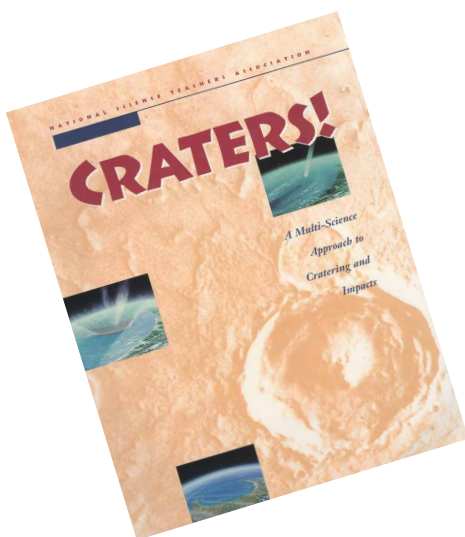
**Suitable for advanced high-school students.**

**T**his is a 20-exercise book with accompanying CD that introduces students to impact cratering as a scientific discipline. There are both student sections and teacher sections for each activity, and I estimate that each exercise would take one or two class sessions.

Most of the exercises are reasonably well designed and fairly interesting. They cover most aspects of impact cratering as a science, such as using craters for age dating a surface, cratering mechanics, and impacts and extinctions. Some of the exercises involve concepts that are sophisticated even for high school, such as trigonometric relations, probabilities, kinetic energy, and trace-element abundances. It seems like it would take a pretty smart class and a very knowledgeable teacher to be able to successfully accomplish and understand all the activities in the book. Some of the exercises would be well-suited for lab experiments or homework assignments in college-level introductory geology courses.

The CD is not mandatory for most of the book's activities and is designed to provide supplementary material. The CD consists mostly of a collection of images of craters throughout the solar system, with an emphasis on the Moon. The images are of high quality and each has an accompanying caption. Overall I would recommend this product to a high-school geology or physics teacher that wants to spend a few weeks on impacts, and it could prove useful to university professors of introductory geology courses.

— Robert Herrick



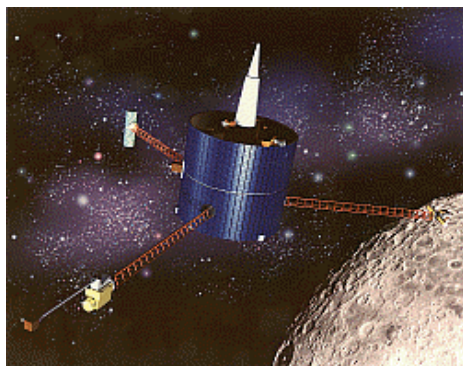
### ***Lunar Prospector Mission***

**Produced by NASA Ames Research Center.**

**Suitable for a general audience.**

NASA Ames Research Center and ACES Entertainment Inc. teamed up for this CD, a smoothly produced trove of information on the *Lunar Prospector* mission, its science, and the people behind it. The review version of the CD was produced in spring 1998, and we are promised updates as the mission and its science evaluation continue. After a brief introductory movie, the viewer can choose what area to explore: People, Interviews, Art, the Mission, Lunar Prospector in Depth, Photos, History, and Mission Clips. Each area is subdivided then into additional levels, most of which then read as Hypercard-like stacks. For instance, LP in Depth includes stacks on the Discovery program, LP's science objectives, spacecraft design, scientific instruments, frequently asked questions,





*Lunar Prospector*

and a timeline. Hidden in all this is most of what the general reader might want to know about LP, at a range of presentation levels from the simplest to some steeped in engineering jargon.

Hidden is an appropriate word, for the CD isn't arranged according to likely audience; for instance, instruments and their measurements are described in a number of places (including interviews) at varying levels of technical and scientific knowledge. The education component of the *Lunar Prospector* program is available at their Web site (<http://www.lunarprospector.ames.nasa.gov>), not on this CD.

This CD sets a high standard for artistic presentation of NASA mission outreach materials. I enjoyed reviewing the CD, and recommend it as an introduction to the LP mission. However, there is always room for improvement. The material could be organized better according to audience level. The history section is not of lunar exploration and science, but of scattered "image bites" of NASA history, with a prominent place for Ames' advances in aviation. I had trouble navigating the CD, as arrows and buttons were not in consistent places and were commonly unmarked. And, on exiting the CD, I needed to reboot my PC (Dell Pentium II, Win 98).

— Allan Treiman

### **Techno-Agent**

**Produced by NASA Goddard Space Flight Center's Technology Transfer/Commercialization Office**

**T**his CD is an advertisement for NASA Goddard's Technology Transfer Program, which aims to take NASA's technological innovations and apply them in practical, commercial products. The CD is cast as a game; the user is Techno-Agent, who chooses which Goddard-developed technologies are useful in a range of applications. To play the game, the user reads screens (or listens to them being read) about some of Goddard's successful technologies, and then either answers questions or chooses an application from a list of choices. The idea of a game is good, but the static presentation doesn't generate much enthusiasm, and the transferred technologies lack zip. It could have been so much more. Ø

— Allan Treiman

### **CLARIFICATION**

In the "The Greenhouse Effect," the cover story for the Lunar and Planetary Information Bulletin, Number 85, it was incorrectly stated that the NASA-developed artificial soil is composed of zeolite, a naturally occurring volcanic clay. The zeoponic plant growth media is actually a mix of zeolite and apatite. Ø

## **BIOMARKER TASK FORCE TO BE ESTABLISHED**

A task force is being formed to produce a document outlining a strategy for the development of biomarkers for use in Mars exploration. These biomarkers will be used to evaluate samples returned from Mars for possible evidence of past biological activity.

Preliminary task-force activities got under way with the symposium on chemical and isotopic biomarkers at the annual meeting of the American Chemical Society in March 1999. However, interested scientists who were unable to attend the ACS meeting are invited to participate in an upcoming symposium focusing on morphological and mineralogical biomarkers at the annual meeting of the GSA in October 1999.

Subsequent to the GSA symposium, the task force will meet at a date and location to be determined, and a report will be prepared for publication as a NASA Special Publication. For more information, contact John F. Kerridge, Department of Chemistry 0317, University of California, San Diego, La Jolla CA, 92093, (619) 534-0443 ([jkerridg@ucsd.edu](mailto:jkerridg@ucsd.edu)). Ø